Notice of Allowability	Application No.	Applicant(s)	
	09/888,612	TOKUDA, TOSHIMICHI	
	Examiner	Art Unit	
	Huyen X Vo	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *12/7/2004*.

2. ☒ The allowed claim(s) is/are *1-12*.

3. ☒ The drawings filed on *6/26/2001* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

W. R. YOUNG
PRIMARY EXAMINER

DETAILED ACTION

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. The abstract on page 25 includes legal phraseology and has been rewritten as follow:

Abstract of the Disclosure

Device for audio frequency range expansion compensates the vocal range by a small quantity of operation, and improves the tone quality and verbal perception. Analog-to-digital converting element converts an input analog narrow frequency band audio signal into a digital signal. Voiced/voiceless judging element distinguishes the voiceless sound section and voiced sound section of audio signal. Aliasing signal generating element disposes sampled signals on every relevant order of sample point of digital signals issued from the analog-to-digital converting element, and replaces the value of the every relevant order of sample point spuriously with zero value. A filter changes over the filter characteristic based on the judged result of the voiced/voiceless judging element. Digital-to-analog converting element converts an output digital signal from the filter into an analog signal.

Allowable Subject Matter

1. Claims 1-12 are allowed over prior art of record.

2. The following is an examiner's statement of reasons for allowance: *Toshihiro (JP 09023127)* teaches an analog-to-digital converting means for sampling input analog narrow frequency band audio signal at a sampling frequency of substantially four times or more and even number multiple of upper limit frequency, and converting the signal into a digital signal (*referring to translation provided*); aliasing signal generating means for disposing sampled signals on every relevant order of sample point of digital signals issued from said analog-to-digital converting means, replacing the value of the every relevant order of sample point spuriously with zero value, and generating a digital signal spuriously having frequency components of twice as high as the input frequency component of narrow frequency band audio signal and having a frequency spectrum folded the spectrum of the input signal symmetrically at the frequency axis which is the upper limit frequency of input audio signal (*referring to translation provided*); and signal converting means for converting a digital signal issued from said filter into an analog signal, and issuing an audio signal of wide frequency band (*referring to translation provided*). Makhoul et al. (IEEE Publication) also teach all the steps mentioned above. Zinser, Jr. et al. (US 6078880) teach a voicing cut-off frequency estimator in that the cut-off-frequency is determined and transmitted together with other control parameters to the receiver side, wherein the receiver side generates voiced and unvoiced excitation signals based on the cut-off-frequency information and other control parameters. The generated voiced and unvoiced excitation signals are added together and is fed to an

LPC filter to synthesize speech (*the operation of figure 5*). Alone or together, Toshihiro, Makhoul et al., and Zinser, Jr. et al. fail to specifically disclose a voiced/voiceless judging means for analyzing the digital signal issued from said analog-to-digital converting means, and distinguishing a voiceless sound section not including vowel from a voiced sound section including a vowel, in the audio signal; and a filter for limiting the band of the output signal of said aliasing signal generating means by changing over the low pass filter characteristic to a low cut-of frequency state for the voiced sound section and a high cut-off-frequency state for the voiceless sound section, based on the judged result by said voiced/voiceless judging means. Furthermore, it would have not been obvious to one of ordinary skill in the art at the time of invention to modify/combine Toshihiro, Makhoul et al., and/or Zinser, Jr. et al. to obtain the claimed invention. Therefore, claims 1-12 are allowed over prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen X Vo whose telephone number is 571-272-7631. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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